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1) $HCOOH$ - Methanoic acid

$HOOCCH_2CH_2CH_2COOH$ - propane-1,2,3-tricarboxylic

$CH_3CH_2CH_2COOH$ - butanoic acid

HO_2CCO_2H - Ethanedioic acid

$CH_3(CH_2)_4COOH$ - Hexane-1,6-dioic acid

2) i) Physical appearance - ~~Lard~~ They are solids with low melting points.

ii) Boiling points - The simplest carboxylic acid boils at 101°C (214°F)

iii) Solubility - It is ~~solubility~~ soluble in water

3) i) Hydrolysis of alkanoates in acid media

$RCOOR' + H_2O(l) \longrightarrow RCOOH + R'OH$

ii) Distillation of anhydrous sodium ethanoate with concentrated H_2SO_4

$RCOONa(s) + H_2SO_4(aq) \longrightarrow RCOOH(aq) + NaHSO_4$

4) Carbonation of a Grignard reagent and organolithium reagents;

$RLi + CO_2 \rightarrow RCO_2Li$

Base-catalyzed cleavage of non-enolized ketones, especially aryl ketones

$RC(O)Ar + H_2O \rightarrow RCO_2H + ArH$

5)